

INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1997	Park: Shenandoah NP						
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Name: Dr. Thomas R. Wentworth	Phone: n/a	Email: n/a					
Permit#: SHEN1997AUKX							
Park-assigned Study Id. #: unknown							
Project Title: Genetic Variation In Eastern North American Abies (N-225)							
Permit Start Date: Jan 01, 1997	Permit Expiration Date Jan 01, 1998						
Study Start Date: Jan 01, 1997	Study End Date Jan 01, 1998						
Study Status: Completed							
Activity Type: Research							
Subject/Discipline: Land Use / Forestry							
Objectives: <p>In this study we are completing a survey of chloroplast haplotype diversity and geographic differentiation in the 3 eastern North American Abies taxa (Abies fraseri, A. balsamea, and A. balsamea var. phanerolepis) using chloroplast DNA microsatellites, or simple sequence repeats (SSR's). Fraser and balsam fir are classified as separate species largely on the basis of cone scale and bract length. Intermediate fir, a variety of balsam fir found in several populations within Shenandoah National Park, exhibits morphological characteristics similar to both species. Though these trees are widely distributed and adapted to diverse environments there is little morphological differentiation between groups. Prior research examining the genetic, chemical and morphological variation in the taxa have found limited differentiation of Fraser and balsam fir. Chloroplast microsatellites may provide a higher level of resolution among closely related taxa. Objectives of this study include::Objective 1. Describe chloroplast DNA gene diversity in range wide representatives of A. fraseri, A. balsamea and A. balsamea var. phanerolepis.;Objective 2. Assess the usefulness of an organelle DNA based marker system in inferring population history, cytoplasmic structure, and phylogenetic distinctiveness of populations of A. fraseri, A. balsamea, and A.b. var. phanerolepis. ;Objective 3. Assess the concurrence of morphological variation in the 3 taxa with chloroplast DNA haplotype diversity.</p>							
Findings and Status: <p>Initial data generated with chloroplast microsatellites show that there is geographic variation in haplotypes among these taxa with more than 30 haplotypes seen in a sample of 40 trees. DNA is being PCR-amplified from range wide representatives of Abies and screened with 20 primers developed for microsatellite loci found in the complete sequence of the Pinus thunbergii chloroplast. Two of the primers show a high degree of polymorphism and chloroplast haplotype diversity as well as geographic differentiation. A total of 8 trees from Shenandoah National Park, 4 from Hawksbill Mountain and 4 from Stony Man Summit, are included as representative samples of intermediate fir. These samples have been deposited in the North Carolina State University Herbarium. Initial screening of these individuals shows little differentiation within these populations, but divergence from populations of Fraser and balsam fir.</p>							
For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?							

Yes	
Funding provided this reporting year by NPS: 0	Funding provided this reporting year by other sources: 0
Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university: n/a	Annual funding provided by NPS to university or college this reporting year: 0